Identifying Hospital Admissions Due to Adverse Drug Events: Using a Computer-Based Monitor

Ashish K. Jha, MD, Gilad J. Kuperman, MD, PhD, Eve Rittenberg, MA, Lucian L. Leape, MD, Jonathan M. Teich, MD PhD, Brian Shea, PharmD, David W. Bates, MD, MSc
Brigham and Women's Hospital and Harvard Medical School, Boston, MA

ABSTRACT

We developed an adverse drug event (ADE) monitor based on published rules, and used it to detect admissions to the hospital due to ADEs. Over the study period, the ADE monitor identified 76 admissions to the hospital due to ADEs. Of these, 21 were determined to be preventable. The hospital-wide rate of admissions due to ADEs was 1.4/100 admissions and the preventable ADE admission rate was 0.4/100 admissions. The 76 events were associated with $1.2 million in costs. The computer monitor required 11 person hours a week to execute.

INTRODUCTION

Adverse drug events (ADEs) are common and costly[1-4]. Hospital admissions due to adverse drug events are costly, and many may be preventable[5]. Few institutions have ongoing surveillance for admissions due to ADEs. Most hospitals identify such admission using spontaneous reporting, but this is insensitive; chart review identifies many events but is costly. Computer monitors effectively identify ADEs that occur after hospitalization[2] but their usefulness at identifying admissions due to ADEs is unclear. Therefore, we undertook a prospective study to evaluate the effectiveness of a computer monitor at identifying admissions to the hospital due to adverse drug events, to measure how many were preventable, to calculate their costs, and measure the resources involved in identifying these admissions.

METHODS

Using published rules[2], we developed an event monitor to look for incidents suggesting the presence of an ADE. A trained reviewer then performed chart review to evaluate each incident. All events thought to be admissions due to an ADE were classified according to whether an event was present and preventability by a physician experienced in classifying ADEs. Using the hospital's financial data, we calculated the cost of each event.

RESULTS

Among the 3,238 admissions, we found 76 (2.3%, 1.4% adjusted for service type) to be ADE-related.

Of these, 28% were preventable. For identifying admissions due to an ADE, the positive predictive value for computer-generated alerts was 3.5% for alerts at any time and 6.4% for alerts within two days of admission. The 76 admissions were associated with $1.2 million in hospital costs which extrapolates to $6.2 million in annual hospital costs. Preventable ADEs cost $218,000 and the annual projection for the hospital was $1.2 million. The computer strategy required 11 person-hours per week to execute.

DISCUSSION

We found that 1.4 of every 100 admissions were due to ADEs. These events were severe, often preventable, and very expensive. Most chart review studies have found rates closer to 3% of admissions, and our estimate probably represents a lower bound. The capture rate of the monitor can be improved with the addition of more coded data. Furthermore, chart review is too costly to be practical for ongoing surveillance. Computer monitors represent an efficient approach for identifying ADE-induced admissions and can facilitate quality improvement efforts to decrease the frequency of these events.

References

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